Water Efficiency

(Thinking Outside The Bowl)

Creative Conservation

by

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Water Efficiency

- **Standard Methods**
  - **Showerheads**
  - **Low Flow Toilets**
  - **Aerators**
  - **Nozzles**

Water Efficiency

- More Creative Methods
  - Reclamation
  - Re-use
  - Recycling

Water Efficiency

- More Creative Methods
  - NAS Jacksonville (Reclamation)
  - MCAS Iwakuni (Re-use)
  - NAS Patuxent River (Reclamation)

NAS Jacksonville

- **A 1994 study found that effluent reuse was feasible and economical.**
- **However, the NAS Jacksonville golf course was too far away, and the activity did not see any obvious applications for the reclaimed effluent.**
- **The St. John's River Water Management District was eager to implement re-use.**

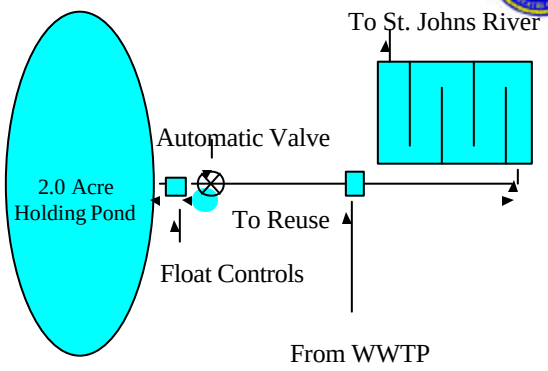
NAS Jacksonville

- **The St. John's River Water Management District "suggested" that the Navy effluent be "given" to the neighboring Timuquana Country Club for their golf course.**
- **As a result, the effluent from NAS Jacksonville, is now used to water the neighboring golf course.**

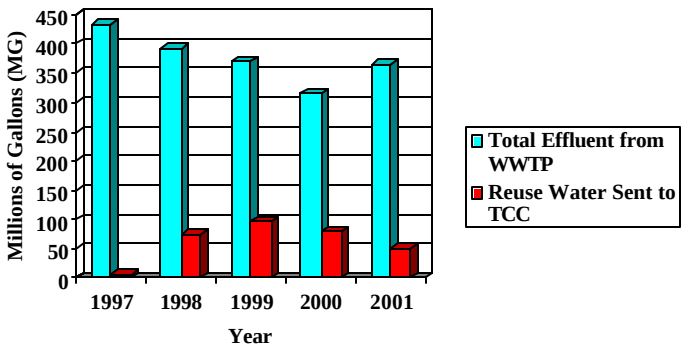
NAS Jacksonville

- **The project cost $250K - which the country club paid for.**
- **The demand on the treatment plant is 25% of it's total capacity.**

Reuse System



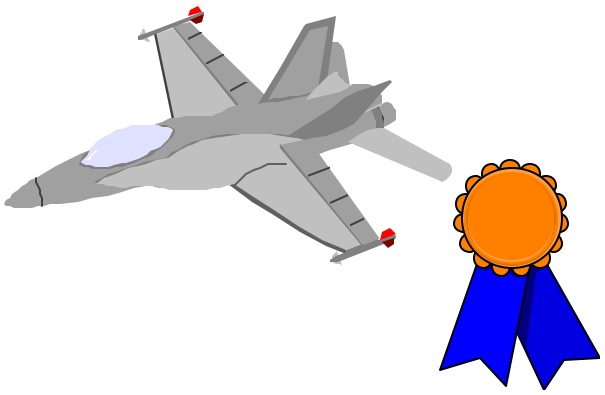
Reuse Water Usage



NAS Jacksonville

- **As an added bonus, the station effluent is now of "re-use" quality and the other 75% unused flow is available for further re-use.**
- **The activity is now expanding their earlier view of "obvious re-use" candidates, and has identified several new options, including ballfields, cooling tower, another neighboring park.**

MCAS Iwakuni



MCAS Iwakuni

- **Need to find low cost initiatives due to cost sharing with the Government of Japan.**
- **Very proactive energy staff in place.**
- **Looking for ways to reduce water consumption beyond the traditional methods.**

MCAS Iwakuni

- MCAS Iwakuni uses a sludge incinerator as part of their sewage treatment.
- They use potable water for cooling the bearings on the exhaust fans and air for combustion.

MCAS Iwakuni

- The proposal is to use the sewage effluent to provide this cooling.
- Savings:
  - Between 1.5 and 2.0 million gallons of potable water annually.
  - Approximately $15,000 per year.
- Cost: $60,000

NAS PAX River

- **Existing water treatment plant at capacity.**
- **$3.63M to upgrade plant to meet future loading with an additional $107K annual operation cost.**
- **Reclamation, if uses could be found, would eliminate the need to expand the plant.**

Potential Water Uses (gpd)

Cooling Water

42,000

Golf Course Irrigation

36,000

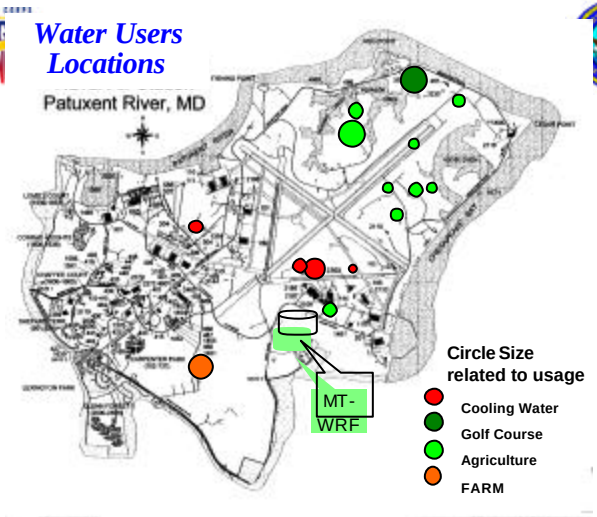
Agriculture Field Irrigation

103,000

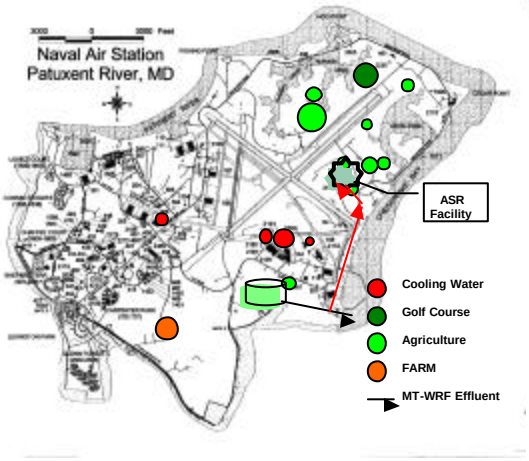
FARM Irrigation

30,000

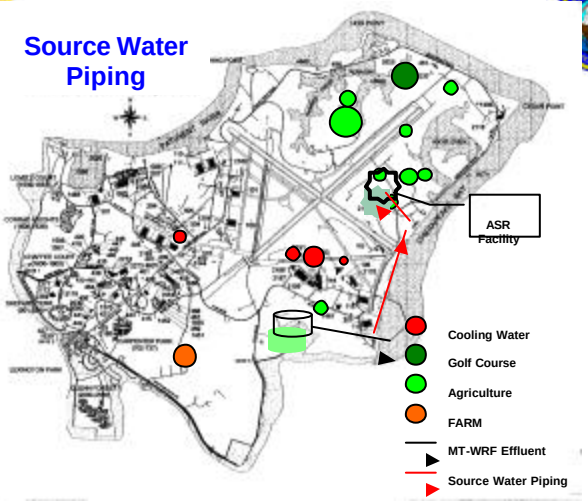
Water Users Locations



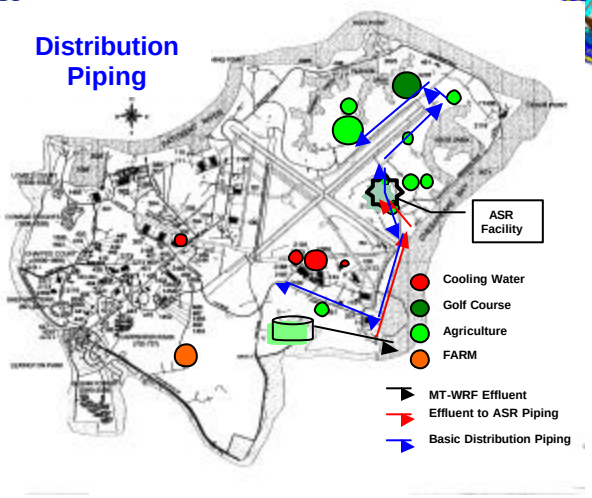
Good ASR Location Near Users



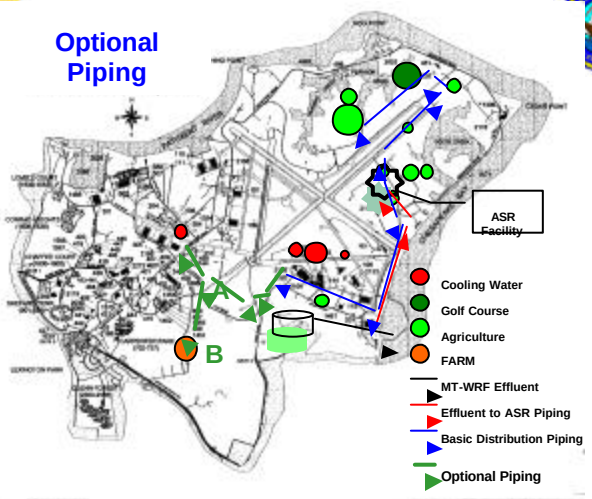
Source Water Piping



Distribution Piping



Optional Piping

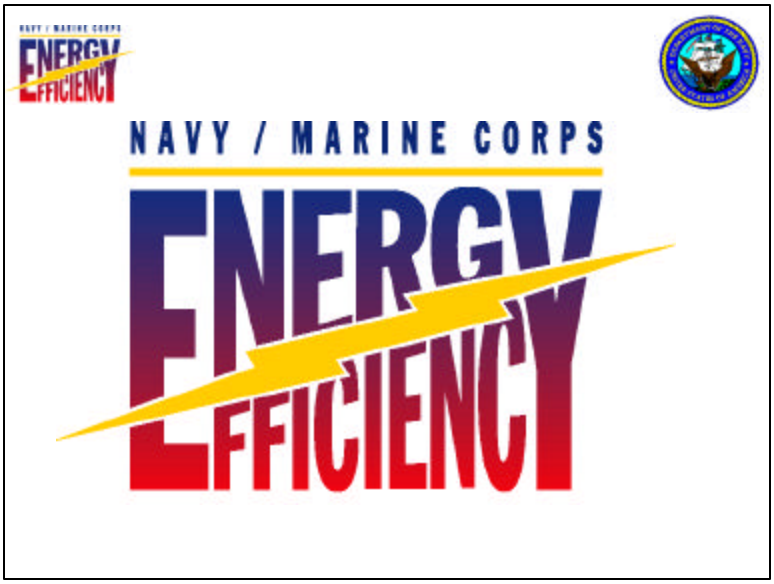


Cost for 1.2 MGD Reuse System

Booster Pump Station	$50,000
Aquifer Storage and Recovery	$420,000
Wet Well and Pump Station	$170,000
Piping	$1,410,000
Total Basic System	**$2,050,000**
Option A: Connect N Engineering	**$360,000**
Option B: Connect to FARM	**$190,000**

Savings due to ASR

Avoided Cost for MT-WRF Upgrade	$3,630,000
- Cost for Basic Reuse System	($2,050,000)
Capital Cost Savings	**$1,630,000**
Annual O&M Savings (METCOM)	$107,000
Annual Water Savings (Navy)	$200,000
Total Annual Savings	**$307,000**


NAVY / MARINE CORPS
ENERGY
EFFICIENCY